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EXAMINER
MILLER, MARTIN E

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/329,217	Applicant(s) PROKOSKI, FRANCINE J.
	Examiner Martin Miller	Art Unit 2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) *14-17* is/are allowed.

6)☐ Claim(s) *1-13 and 18-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to for the reasons stated in the Draftsman's PTO-948.

2. Additionally, Figure 14 has lines drawn through the text of the drawing, it is unknown whether the applicant intended to cross out this text or if the line is part of a graph.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it exceeds 150 words and is multiple paragraphs. Correction is required. See MPEP § 608.01(b).

4. The disclosure is objected to because of the following informalities: applicant has included a "references" page after the claims. If applicant would like these references considered it is suggested that the applicant submit and Information Disclosure Statement stating the relevance of each reference. The examiner has not considered these references. Appropriate correction is required.

5. Claims 5, 7, 10, 12, 14, 17, 19 and 24 are objected to because of the following informalities:

as per claim 5, in limitation "d.", it has the words "pairs" and "pair(s)", the first instance of "pairs" should also be "pair(s)" to avoid confusion.

as per claim 7, the second limitation has a period (.) after the word "consideration".

as per claim 10, it has a period after the number "9".

as per claim 12, it has a capitalized letter after the period of "step f."

as per claim 19, there are two (2) limitations labeled "c.".

as per claim 24, "step e." recites a limitation of "considering also" which may be made more precise by being replaced with --and based upon--.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 3, 4, 6, 7, 14, 17, 23 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "step f " in its body, but there are no step "e" in claim 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 recites the limitation " step g, step h " in its body, but there are no steps "e or f" in claim 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "step f in claim 5" respectively in their body, but there are no such steps in claim 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitation " step a" respectively in their body, but it unclear whether applicant wishes to replace step "a" in claim 5 or what is the purpose of "step a" in claim 7. This makes the claim indefinite. The Examiner is treating the "step a" of claim 7 as a limitation in addition to the "step a" in claim 5. Also, the limitations of "weapon-specific and incident-specific tagging information" lacks antecedent basis in the claims 5 or 6.

As per claim 14, there is no period at the end of the claim. Therefore, the claim is indefinite.

As per claim 17, there are two step "b."s and there in no period at the end of the claim. Therefore, the claim is indefinite.

The term "enhances" in claim 23 is a relative term that renders the claim indefinite. The term "enhances" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. One of ordinary skill in the art would not know to what degree or extent to which the applicant means to "enhance the manufactures marks". The Examiner suggests changing "which enhances to --to enhance-- to overcome this rejection. Claim 23 also should have an "a" before the word "temperature" in "step a".

Claim 24 recites the limitation "the radiometric infrared camera" in "step b." but there is no prior recitation. There is insufficient antecedent basis for this limitation in the claim. The claim also recites "radiometric infrared camera" in "step b", but then in "step d" refers to a "radiometric camera". The claim should be corrected to insure that the two cameras in the claim are the same camera, not two different cameras.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

9. Claims 5-12 are rejected under 35 U.S.C. 102(a) as being anticipated by Demoly et al. (hereinafter Demoly), US 5857202.

As per claim 5, Demoly teaches:

a. characterize the unknown ballistic item by producing a tagged image sequence (figure 5, element 59 and 591, col. 7, ll. 42-50);

b. compare the image sequence with those contained in the database (fig. 5, element 53, "comparison", col. 4, ll. 58-62, col. 6, ll. 8-15, col. 8, ll. 64-66).

c. determine those sequences in which one or images are similar to the unknown tagged image sequence (col. 8, l. 66-col. 9, l. 5, col. 9, ll. 39-49);

d. display the similar pairs of images to the ballistics examiner who reviews the display and rules that the unknown ballistic item is a match to an item in the database if the similar pair(s) of images are sufficiently alike (figure 5, element 53, which pertains to display methods, element 56, which presents the target score against the reference, col. 8, ll. 55-66).

As per claim 6, Demoly teaches:

step f is performed automatically by further image processing (col. 8, l. 55-col. 9, l. 5).

As per claim 7, Demoly teaches;

e. compare the weapon-specific and incident-specific information of the similar image pairs (col. 6, ll. 8-16).

a. display the similarities and dissimilarities (shown by showing all of the images associated with the reference image, see fig. 5, element 59) in the tagging information along with the images for further consideration by a ballistics examiner who reviews the display and rules that the unknown ballistic item is a match to an item in the database if the tagging information as well as the similar pair(s) of images are sufficiently alike (figure 5, element 53, which pertains to display methods, element 56, which presents the target score against the reference, col. 8, ll. 55-66).

As per claim 8, Demoly teaches:

step i. is performed automatically by further image processing (col. 8, l. 55-col. 9, l. 5).

As per claims 9-12, these claims recite substantially the same limitations as claims 5-8 except for a narrowing limitation of "extracted features"; however, Demoly teaches that the extracted features are scratches and striations, which are tagged as images associated with a particular file (fig. 5, elements 591 and 592).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-4, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Demoly and Peleg, US 4884696, further in view of Xu et al. (hereinafter Xu), US 5761336.

As per claim 1, Demoly teaches:

a. Producing a sequence of digitized images (abstract). Demoly also teaches:

b. tag each item with the ID of the item (fig. 6, element 621)

d. store the tagged image sequence in a database (col. 6, ll. 3-4).

Demoly does not specifically teach the digitized images are infrared or that the images include focus points of the highest and deepest features. However, Peleg teaches a well-known classification system that is capable of classifying ballistic items (e.g. ordnance shells, bullets and the like) and that the classification is performed based upon data gathered from sequences of infrared images (video frames) (col. 3, ll. 52-64, col. 8, ll. 29-37 and figure 12). Peleg also states that his image acquisition devices are capable of multiple resolutions (col. 19, ll. 60-65).

Neither Demoly nor Peleg specifically teach that the multiple images acquired include features from the deepest to the highest features of the item under test. However, Xu teaches that the best comparisons for defect detection, which is a comparison between a target item images and stored reference images, is to use varying depths of field to get minute details as well as larger views so that the minute details can examined in the context of surrounding features (col. 5, ll. 25-54). This context analysis allows for a reduction of false defect detections or similarly, reduces false matches of reference markings on a ballistic item.

Based upon the combination outlined above, Demoly suggests:

c. tag each item with specifics of the imaging set up including focus position, and size of the digitized image array. The is an obvious step since Xu teaches looking a multiple images at

various aperture settings and to make true comparisons it would obviously follow that focus position and resolution would be included in the data provided to the examiner in order for the examiner to make a credible comparison (col. 5, ll. 25-54).

It would have been obvious to one of ordinary skill in the art to utilize the image acquisition features of Peleg and Xu that are both directed to gathering images of minute details of an object including ballistic items, for comparison with the data presentation features of Demoly to extract data features concerning a target projectile and exploit these data in a data processing system provided with application software that makes it possible to select criteria of the target and the reference files to evaluate the probability of similarity between the target item and a reference item.

As per claim 2, Demoly teaches;

e. produce a photomontage (fig. 5, element 59) from the tagged image sequence in which each section of the montage image is the corresponding section of the image from the tagged sequence in which that section is on sharpest focus. This is a mere display choice of the user interface designer, any number of other choices could obviously be provided to the user.

As per claim 3, Demoly teaches:

f. replace each tagged image in the sequence with a tagged extracted feature image containing only features at least a specified size (criteria, col. 4, ll. 7, 13, and 16) extracted from the tagged image. (figure 5, elements 59 and 591). Demoly teaches that each feature must meet specifc criteria with respect to shape, texture, and striation. It would have been obvious to one of ordinary skill in the art to insure that the features were a specific size in order to prevent the problem of too many data points that would lead to a problem similar to that addressed by Xu.

As per claim 4, Demoly teaches:

g. add to each tag weapon-specific ancillary information including caliber (fig. 6, element 635, type of information (fig. 6, element 64), direction of twist (fig. 6, element 663), number of lands (fig. 6, element 637), serial number (to one of ordinary skill in the art it would have been obvious to include if so desired by the designer to include a button for serial number).

h. add to each tag incident-specific information including type of crime committed (fig. 6, element 614, location where item was found (again this is data that would be covered in obviously be covered in some police report and would be available for the database if it were so desired by the designer), associated names (fig. 6, element 613), method of crime (again this is data that would be covered in obviously be covered in some police report and would be available for the database if it were so desired by the designer, but it would seem that if using Demoly's figure 6 as an example that if the bullet is associated with a first degree murder that one of ordinary skill would know the method of the crime was probably a shooting or some criminal method that would make the crime investigator want to view ballistic items).

As per claim 13, Peleg teaches:

e. heating or cooling the ballistic item to vary its temperature (col. 4, ll. 35-36, Peleg teaches that the internal energy dissipation is one of the mechanical properties that can be measured.)

f. producing an image sequence in which both focus (Xu teaches varying the focus, col. 5, ll. 25-54) and temperature are varied. It would have been obvious to one of ordinary skill in the art to also acquire an image if that was going to be the method of measuring the temperature changes of the target item.

g. tagging each image with the corresponding temperature. It would have been obvious to one of ordinary skill in the art to keep track of this information for future reference so as to make a credible comparison of similar ballistic items.

As per claim 19, Peleg teaches;

a. IR camera with lenses (figure12) and Xu teaches:

focus control (col. 5, ll. 25-54)

b. mechanism for varying the focus control to produce a sequence of images (col. 5, ll. 25-54). Demoly teaches:

c. image digitizer and storage (col. 3, ll. 44-58)

c. mechanism for tagging images with ancillary information (col. 4, ll. 52-58)

d. feature extractor (col. 4, ll. 59-60)

e. processor for characterizing the features (col. 4, l. 63-col. 5, l. 5, ll. 62-67)

f. processor for creating a montage (figure 5, element 59)

g. display (figures 5 and 6)

h. mechanism for positioning the item within the field of view (col. 3, ll. 43-51microscopes typically have a stage upon which items to be images are set).

It would have been obvious to one of ordinary skill in the art to utilize the image acquisition features of Peleg and Xu that are both directed to gathering images of minute details of an object including ballistic items, for comparison with the data presentation features of Demoly to extract data features concerning a target projectile and exploit these data in a data processing system provided with application software that makes it possible to select criteria of

the target and the reference files to evaluate the probability of similarity between the target item and a reference item.

12. Claims 18 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Demoly and Xu as applied to claim 1 above, and further in view of Bauhahn et al. (hereinafter Bauhahn), US 5483387.

As per claim 18, Demoly teaches using multiple images to identify a particular bullet. Xu teaches that varying focus allows for a more accurate identification of an object. Peleg teaches using infrared imaging to identify objects. However, neither Demoly, Xu nor Peleg teach using multispectral analysis to determine the type of residue or coating tht is on the bullet. However, Bauhahn teaches an infrared system that is capable of evaluating the spectral properties of particular substrates having coatings or residues (col. 1, ll. 7-10). Xu teaches varying focus to produce an image sequence, col. 5, ll. 25-54 to produce an image sequence which is limitation b.

Bauhahn teaches:

a. apply a sequence of spectral filters to the IP camera (col. 2, ll. 15-18, col. 6, ll. 58-65).

c. extract features from each image in the sequence. Bauhahn teaches identifying the presence of spectrally active chemical agents (col. 7, ll. 5-10) which could be any agent the investigator using Demoly's system would desire.

Demoly teaches that the search criteria is user selectable and

d. compare the feature set in images which have the same focus setting (this is obvious so as to compare images that would correspond to one another) but different spectral filters.

f. annotate features with likely type of residue based upon filter sensitivity. Bauhahn teaches identifying chemical agents (col. 7, ll. 1-10)

Again Demoly as stated in the rejection above Demoly teaches that these features are stored in the image collection. Demoly teaches:

e. display those features which are filter-sensitive as possible residue(fig. 5, element 59)

It would have been obvious to one of ordinary skill in the art to utilize the tunable IR filters of Bauhahn in the system of Peleg and Xu to provide ballistic data to a system like Demoly's particularly when an investigator using Demoly's system would obviously desire to obtain chemical agent information. Modification of the system is particularly easy since bauhahn teaches that his system is ultra compact (col. 7, ll. 66-67).

Claim 20 recites substantially the same limitations s as 18 above and analogous remarks apply.

As per claim 21, Demoly teaches:

m. database of characterized ballistic items (col. 3, l. 65-col. 4, l. 1)

n. database matching engine (fig. 5, element 54, col. 3, ll. 7-14)

o. output or display mechanism (fig. 2, element 10)

13. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Demoly as applied to claim 1 above, and further in view of Ort et al. (hereinafter Ort), Us 5659626.

As per claim 22, Demoly teaches comparing unknown target images to stored known images (Abstract). Demoly also teaches tagging a feature and matching the list of features with corresponding lists in the known item database (col. 6, ll. 3-15). However, Demoly does not

teach computing distances between features and using that as a criteria for searching the database. However, Ort teaches:

compute the centroids location for each feature including all striations, gouges, breach face marks, and firing pin indentions, where each striation is considered a separate feature. (col. 24, ll. 33-36, col. 28, ll. 1-3)

compute the distances between each pair of centroids.(col. 24, ll. 39-46, col. 28, ll. 37-54).

Ort is directed towards a pattern detection system for the primary purpose of law enforcement (col. 1, ll. 14-15). Demoly's pattern matching system also is for the purpose of law enforcement. Ort teaches his system locates a feature and then calculates the straight line distance between features based upon pixel count (col. 24, ll. 33-36, col. 28, ll. 1-3). Additionally, Ort teaches that these features are input into a computer to be used by a classifier algorithm (col. 24, ll. 39-46). Such data is stored for later use (col. 28, ll. 37-54). Furthermore, Ort teaches that a search filter uses additional personal data (as does Demoly, col. 6, ll. 10-15)besides fingerprint information to select candidates with close likenesses to the search candidates (col. 32, ll. 21-25). It would have been obvious to one of ordinary skill in the art to utilize the well known pattern recognition method of Ort in another law enforcement pattern recognition system such as Demoly to identify features of a search candidate for comparison to data features stored in a database.

14. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peleg as applied to claim 1 above, and further in view of Matoba et al. (hereinafter Matoba), US 4983836, and Forester et al. (hereinafter Forester), US 5823677.

As per claim 24, Peleg teaches inspecting a ballistic object (col. 1, l. 20) and determining its internal energy dissipation characteristics (col 4, ll. 35-36 and using infrared imaging (figure 12)

Matoba teaches that it is well known to use infrared imaging to determine the depth of a material and to measure the extent of the area which may have a reduced depth (col. 5, ll. 30-43, col. 6, ll. 53-55, 65-68, col.8, ll. 59-60, col. 8, l. 65-col. 9, l. 2, col. 9, ll. 10-17). But Matoba does not specifically teach that the item in question is heated to an elevated temperature. However, it is well known in the field of infrared heat measurements that an item can be raised to an elevated temperature in order to obtain a time series of images to detect a rate of heat loss. At steady state, no item will have a heat loss or gain for that matter. So obviously an item must be heated to obtain its rate of heat loss. Forester teaches:

measure the mean temperature of the item using radiometric infrared camera (Forester teaches detecting heat loss from a mean constant temperature, col. 3, ll. 5-8).

capture a sequence of images as the item cools (col. 3, ll. 52-58).

capture for each image the mean temperature using the radiometric camera (col. 3, ll. 47-51).

Forester nor Peleg teach estimating the volume of the depressed feature. However, Matoba teaches that he can determine the distance of the area with the non uniform depth and a measurement of its depth (col. 9, ll. 10-17). One of ordinary skill in the art would be able to use

such measurements to estimate the volume of the depressed feature. Furthermore both Matoba and Forester would take into account the material composition of the item in order to get an accurate measurement of the heat signature and in Foresters case to insure true readings of the the rate of heat loss (col. 3, ll. 20-23).

It would have been obvious to one of ordinary skill in the art to utilize the item classification features of Forester who uses thermal heat loss data as a means of classification in combination with the infrared depth calculation system of Matoba to provide ballistic item classification to the Peleg system in order to make an accurate infrared determination of the item under test.

Allowable Subject Matter

15. Claim 16 is allowed.

16. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. Claims 14 and 17 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following U.S. patent(s) refer(s) to: Baldur et al. , US 5390108, US 5659489, US 6154562, to computer bullet analysis including adjusting depth of field; Cofek, US 3680966,

teaches inspecting shells, as does Lajeunesse et al., US 6327032; Melen, US 6320979, teaches collecting a number of images at varying depths of field.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Miller whose telephone number is (703) 306-9134. The examiner can normally be reached on Monday-Friday, Maxi-flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

mem
June 4, 2002